



## BEARING PILE FIELD SECTION 702

**702.1 Scope.** To establish procedures for inspection and reporting of bearing piles. Reinforcing steel, round timber piles, and portland cement concrete shall be inspected in accordance with the corresponding sections of this Manual.

### 702.2 Apparatus.

- (a) Micrometer capable of measuring to 0.0001 in. [0.00254 mm] and accurate to within at least 0.001 in. [0.0254 mm].
- (b) Rule with suitable graduations to accurately measure the material to be inspected.
- (c) OK - MoDOT stamp.
- (d) Weather resistant marking materials.

**702.3 Procedure.** Bearing piles of structural steel or cast-in-place piling are normally inspected and reported by other divisions. Precast and precast-prestressed concrete piles manufactured at a commercial precasting plant are normally inspected by this Division. Acceptance of precast and/or prestressed concrete piles is to be based on the inspection of materials being incorporated into the sections; compressive tests on cured concrete cylinders; and inspection of the finished section, including amount and placement of reinforcement.

**702.3.1 Materials.** The inspector shall insure that only inspected and approved materials are used in the fabrication of precast or prestressed bearing piles. The fabricator shall submit a proposed portland cement concrete mixture for approval. The district Operations Engineer shall insure that the proposed mix meets the designated requirements.

**702.3.1.1** The contractor shall furnish two copies of the certified mill test report giving the chemical analysis and results of physical tests on the prestressing material furnished. The contractor shall also furnish two certified copies of the stress-strain curve representative of the lot to be used. The certification shall show the lot number and the material shall be tagged for identification purposes. The inspector shall carefully examine the certifications to insure that they are applicable and show conformance with the specifications. Prestressing strands may be accepted on the basis of a manufacturer certification certifying that the material meets the requirements of AASHTO M203. The strand may also be accepted based on the observation of physical tests and a mill test report giving chemical analysis. Samples for physical testing shall be obtained and tested at the manufacturer's plant or an approved commercial testing laboratory in the presence of Department personnel. One-half inch [12.7 mm] diameter prestressing strand may be submitted to the Laboratory at the discretion of the district Operations Engineer. A sample of prestressing strand shall consist of two pieces of strand, each a minimum of 5 feet [1500 mm] in length. The ends of the strand shall be tied clamped, fused or otherwise secured to prevent unwinding or fraying during shipment. A properly completed Form T-617 shall accompany the sample showing the manufacturer's name, the brand name and designation of the material, lot number, and net quantity with a copy of the mill test report and the stress-strain curve attached.

**702.3.1.2** Structural steel for use in precast or prestressed piles shall be measured to determine compliance with the dimensions shown on the plans. A manufacturer's certification shall be obtained showing typical test



results representative of the material and certifying that the material meets the requirements of the Specifications. The inspector shall carefully examine the certifications to insure that they are applicable and show compliance with the specification.

**702.3.2 Forms.** The inspector shall insure that forms and form work comply with the applicable requirements of Specification Sec 703 and Standard Drawing 702.01.

**702.3.3 Placement of Reinforcement.** The inspector shall insure that the placing and tying of reinforcing bars conforms to the applicable requirement of Specification Sec 706, Standard Drawing 702.01, that all reinforcing steel and prestress strands are properly placed and are clear and free. All reinforcing steel and prestress strands shall be checked to insure that they are free from form oil or other material that might serve as a bond breaker. Prestressing operations should be in accordance with the applicable paragraphs of [Field Sec 705](#) of this Manual.

**702.3.4 Placing and Consolidating Concrete.** The inspector shall insure that the placing, consolidating, and finishing of concrete is in accordance with Specification Sec 702.2.2 and the applicable provisions of Specification Sec 703.

**702.3.5 Curing.** The inspector shall observe curing operations to verify that the requirements of Specification Sec 703 and 702.2.2 are met.

**702.3.6 Concrete Testing.** During the placement of the portland cement concrete, tests shall be performed to insure that the requirements of Specification Sec 702.2.2 are met. Portland cement concrete shall be inspected in accordance with [Field Sec 501](#) of this Manual and Sec 500 of the Construction Manual. Tests for determining consistency and air entrainment shall be performed. At least 2 sets of specimens for compressive strength shall be prepared in accordance with Sec 501.16.5 of the Construction Manual and cured in the same manner as the piling.

**702.3.7 Form Removal.** Precast concrete piling shall be cured a minimum of 48 hours after pouring before forms can be removed unless steam curing is used. The inspector at the fabricating plant is responsible for testing standard rodded cylinders to determine when piling may be moved and curing discontinued in accordance with Specification Sec 702.2.2. Compressive tests are to be performed at the fabricating plant. If questionable results are obtained, the specimens may be submitted to the Laboratory. At least one set of regular 28 day cylinders shall be submitted to the Laboratory on each project to check the portland cement concrete mix design, with a minimum of one set per month of operation of precast plant or more often as deemed necessary. Form C-701 is to be used as an identification sheet with the distribution and title modified as required.

**702.3.8 Prestress Transfer.** The required cylinder strength of concrete at transfer of the tensioning load shall be 4,000 psi [28 MPa] unless otherwise indicated on the plans. Compressive tests are to be performed at the fabricating plant. If questionable results are obtained, the specimens may be submitted to the Laboratory. Form C-701 is to be used as an identification sheet with the distribution and title modified as required.

**702.3.9 Marking.** The inspector shall insure that each precast unit is identified with the date, manufacturer, and identification number. These markings may be indented on the unit or painted thereon with waterproof paint. These markings shall be located as shown on the plans. If the location of the markings is not shown on the plans, markings shall be located in such a manner that they will not be obvious or objectionable to the traveling public after the unit has been placed in its final position.



**702.3.10 Inspection of Completed Units.** The finished units are to be examined for conformance to dimensions, workmanship, and marking in accordance with Standard Drawing 702.01 and Specification Sec 702.2.2. Accepted sections are to be stamped with an "OK-MoDOT" by the inspector.

**702.3.11 Records.** The plant inspector shall maintain a complete file of all data pertaining to the manufacture of the concrete units, either at the manufacturing plant or in the District office. Complete and accurate records of each manufacturing operation shall be kept in a field book. All pertinent data which in any way affects or influences the construction procedures or completed piling shall also be recorded in the field book. Data shall be entered in the field book as soon as it is known. Field notes shall not be copied but shall be kept exactly as they are originally recorded.

## **702.4 Report.**

**702.4.1** Materials shall be reported as shown in the applicable sections of this Manual. Prestressing strands and structural steel, if required, will be reported on Form T-634. The form shall show all pertinent information regarding the material and a copy of the certification shall be attached to all copies of the report. The report is to indicate acceptance, qualified acceptance, or rejection. Appropriate remarks, as described in [General Sec 7.1.2](#) of this Manual, are to be included in the report to clarify conditions of acceptance or rejection.

**702.4.2** Distribution of the reports is to be as shown in the applicable sections of this Manual except that the copies normally forwarded to the Resident Engineer shall be furnished to the Inspector at the precast manufacturing plant. The reports shall be marked "General" and the name of the precast concrete manufacturer must be shown. The material is to be shown for use in "Precast Concrete Units." The plant inspector located at the concrete proportioning plant shall furnish a plant inspector's daily report on Form M-46 for each day's pour identifying the units manufactured from that pour. The name of the manufacturer or set-up must be shown. The original copy of this report shall be forwarded to the Division Engineer, Materials. The duplicate copy shall be furnished to the district Operations Engineer supervising operations at the manufacturing plant. The triplicate copy shall be retained by the plant inspector for the plant records.

**702.4.3** When precast concrete units are delivered to a given project, Form M-31R shall be completed with distribution per Class A in [General Sec 7.1.7.2](#)

